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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/934,175	08/21/2001	Robert L. Canella	4323US (MUEI-0543.00/US)	7405

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EXAMINER	
KIELIN, ERIK J	

ART UNIT	PAPER NUMBER
2813	18

DATE MAILED: 04/17/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/934,175	Applicant(s) CANELLA, ROBERT L.	
	Examiner Erik Kielin	Art Unit 2813	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *13 March 2003* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *9-18 and 20-23* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *9-18 and 20-23* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *21 February 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 21 February 2003 has been entered.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3. Claims 9-18 and 20-23 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. The specification does not provide support for the limitation that the substrate is "substantially planar." The Figs. provided clearly show the surface to be non-planar due to the openings formed therein which occupy a large fraction of the surface. Accordingly the surface is not planar or even substantially planar.

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claim 13 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Amended claim 13 recites the limitation, "at least one conductive trace is formed within an intermediate conductive plane." It is unclear how a conductive trace can be formed within a conductive plane. Basic geometric considerations dictate that if the plane --itself-- is conductive then the trace cannot be distinguished because it would necessarily be a part of the conductive plane.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7. Claims **9**-12, 14-16, 18, and 20-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over US 6,229,320 B1 (**Haseyama** et al.).

Regarding claim 9, **Haseyama** discloses a device for establishing electrical contact between a lead element **28** (called "solder bumps" col. 10, line 38; Fig. 11) extending from an integrated circuit **25** (called "IC" col. 10, line 31) and a "substantially planar" substrate which includes the parts labeled **23** (called "contact unit" col. 9, lines 23-24), **32** (called "test board" col. 6, line 1), and **36** (Fig 11; called "positioning plate" col. 11, line 32) comprising,

a "substantially planar" substrate **23, 32, 36** configured for operably connecting said IC device **25** to at least one electrical component **33** mounted on said substrate;

a spring contact **30** (called "contact pins" Figs. 6, 21A-21B, 23A) including a base portion **71, 72, 73** (Figs. 24A-24C) and a contact portion **63**, said contact portion **63** comprising a resiliently compressible coil spring configured to bias against and electrically contact said lead element **28** of said integrated circuit device **25** (col. 15, lines 32-53; col. 16, lines 17-25); and

an aperture **35** (called "through holes" col. 10, line 45; Fig. 11), **70** (called "through holes" col. 17, line 12; Figs. 24A-24C) opening onto one surface of said substrate **32** and extending a depth at least partially into said substrate **32**, said aperture **70** configured to receive and electrically contact said base portion **71, 72, 73** of said spring contact,

wherein the aperture **40, 70** includes a seat portion **38** (Fig. 11; called "positioning recesses" col. 10, lines 45-47) configured to receive said contact portion **63** of said spring contact, one end of said seat portion opening onto said one surface of said substrate **36**; and a retaining portion **31, 70** (Figs. 24A-24C) configured to receive the base portion **71, 72, 73** of the spring contact **30**, said retaining portion **31, 70** having a first end **31a** (Fig. 11, or as shown in Fig. 14B) connected to an opposing end of said seat portion **38** (or **53A** in Fig. 14B) and a second end **70** extending said depth into said substrate **36, 23, 32**. Note that Fig. 11 is shown in exploded view.

Further regarding the nature of the substrate, the claims do not presently require the substrate to be integrally formed. If it is thought that the claims, as presently drafted, somehow possess the limitation that the substrate is integrally formed, then this may be a difference. However, it has been held that the use of a one-piece construction instead of the separate pieces,

would be merely a matter of obvious engineering choice. See *In re Larson*, 340 F.2d 965, 968, 144 USPQ 347, 349 (CCPA 1965) (A claim to a fluid transporting vehicle was rejected as obvious over a prior art reference which differed from the prior art in claiming a brake drum integral with a clamping means, whereas the brake disc and clamp of the prior art comprise several parts rigidly secured together as a single unit. The court affirmed the rejection holding, among other reasons, "that the use of a one piece construction instead of the structure disclosed in [the prior art] would be merely a matter of obvious engineering choice.") In the instant case, it would be obvious to form the **Haseyama** exploded view substrate integrally, because the parts of the substrate are shown in direct contact with each other in, for example, the **Haseyama** Fig. 9.

Regarding claim 10, see Fig. 9, which shows that the aperture extends all of the way through the substrate portions **36**, **23** but not through **32**.

Regarding claims 11 and 15, a layer of conductive material or a volume of conductive filler **40** (Fig. 11; col. 10, lines 64-67), **70** (Figs. 24A-24C) is disposed on the interior wall of the aperture **35**, **70** and is therefore necessarily "in" the aperture and electrically connects the base portion **71, 72, 73** of the spring contact **30** to said conductive trace **48** (Fig. 16). Further regarding claim 15, it is noted that the claim does not limit from where the depth begins and ends. As shown in Hasegawa --as in Applicant's Fig. 6, for example-- the depth is from the wall of the aperture inward.

Regarding claims 12, 14, 16, and 18, the conductive filler material **70** is electrically connected to conductive traces **70** (**48** in Fig. 16) formed on said one surface and the opposing surface of said substrate **32** (not separately labeled but shown as part of **70** in Figs. 24A-24C).

Further regarding claims 14 and 18, the same Figs. 24A-24C show that the retaining portion of the aperture may open onto the opposing surface of the substrate **32**.

Regarding claim 20, the second end of said retaining portion **70**, opens onto an opposing surface of said substrate **36**, **23**, **32** as shown in Figs. 24A-24C.

Regarding claim 21, the seat portion may be conically shaped (col. 10, lines 45-47). As shown in Fig. 14B, the seat portion **53A** is cylindrically shaped and is integral with the elastic member **31** which is part of substrate **23**.

Regarding claim 22, the seat portion **38** (or **53A**) is configured to at least partially align said lead element **28** of said IC device **25**.

8. Claims 13 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Haseyama** in view of Patent Application Publication US 2002/0075025 A1 (**Tanaka**).

The prior art of **Haseyama**, as explained above, discloses each of the claimed features except for indicating that the substrate has an "intermediate conductive plane," which Examiner interprets to be exemplary shown in the instant Fig. 11, item **669**.

Tanaka, like **Haseyama**, teaches a semiconductor testing tool, and provides an "intermediate conductive plane," (called "internal lead wires 8" in the Abstract), electrically connected to the conductive layer or conductive filler **7**, which beneficially reduces the number of structural elements of the test tool.

It would have been obvious for one of ordinary skill in the art, at the time of the invention to include "intermediate conductive plane," as taught by **Tanaka**, in the substrate of **Haseyama**

to beneficially reduce the number of structural elements, by providing embedded elements, as expressly taught by **Tanaka**.

9. Claim 23 is rejected under 35 U.S.C. 103(a) as being unpatentable over **Haseyama** in view of JP 2000-123935 (**Kawaguchi**).

The prior art of **Haseyama**, as explained above, discloses each of the claimed features except for indicating that the coil spring has at least two coils for contacting the lead elements.

Kawaguchi teaches a similar integrated circuit test tool to **Haseyama** wherein coil springs **20** (Figs 1 and 2) are used to make electrical contact to the lead elements **11** (solder bumps or conductive balls) of an integrated circuit **10**, and states in pertinent part (in the machine language translation) "this invention aims at offer of the contact pin which does not start the defective continuity by the poor contact, and the socket using this contact pin, without generating damage, when ... a conductive ball is contacted" (paragraph [0006]) and in solving the problem provides a contact pin having a contact section, "of the shape of a spiral by two or more number-of-turns sections of a coiled spring edge."

It would have been obvious for one of ordinary skill in the art, at the time of the invention to use two or more coil turns as taught by **Kawaguchi** in the spring contact portion of **Haseyama** to prevent damage and provide better contact with the solder bumps, as expressly taught by **Kawaguchi**.

Response to Arguments

10. Applicant's arguments filed 13 March 2003 have been fully considered but they are not persuasive.

Regarding Applicant's comments regarding claims 42-45. It is noted that Applicant may be limited to a reasonable number of species. As noted in the previous Office action, filed 14 January 2003, it was duly noted that a reasonable number of species has been examined. Accordingly, Applicant cannot add an indefinite number of species.

The rejection under 35 USC 112(1) was withdrawn because Applicant removed the offending limitation from the claims. The objection to the Drawings was also withdrawn for the same reason.

Applicant argues that Haseyama does not teach a "substantially planar substrate." Examiner respectfully disagrees. The substrate of Haseyama does not require the part of the substrate 36, as shown in Fig. 9. The instant figures (for example, Figs. 4 through 11) do not show the end regions of the substrate. The open-ended language of the claims does not preclude the end region from being non-planar. Moreover, it is respectfully submitted that the substrate in Haseyama is "substantially planar" to every extent presented in the instant specification.

Applicant argues additionally that the aperture in Haseyama does not open onto an opposing surface, but this is clearly shown in Figs. 24A through 258. Note especially the part labeled "**32**" because this clearly corresponds to 32 in the other Haseyama Figs. (Fig. 10 for example). Accordingly, Haseyama, like Applicant, has more than one embodiment regarding the aperture.

Applicant argues that the aperture, seat portion, retaining portion, and the at least one conductive trace are not formed in a substantially planar substrate, appearing to object to Examiner's use of the stacked parts of Haseyama. But, as noted in the rejection above, making parts integral is obvious. Moreover, the positioning plate 36 is not required to reject the claims given at least Fig. 9 in Haseyama.

Examiner disagrees that claim 10 cannot be rejected in the manner so done. Applicant has claimed many different species, each of which is disclosed in Haseyama.

Regarding claims 15, 16, and 18, Examiner repeats from the above rejection that Applicant has not defined "depth" in the claims to distinguish over Haseyama.

Applicant's arguments concerning the remaining rejections are predicated upon the alleged failure of Haseyama to disclose the "substantially planar substrate" to which Examiner has already respectfully disagreed. The arguments above are incorporated herein by reference for the sake of brevity.

Conclusion

11. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

US 6,535,002 B2 (**Haseyama** et al.) is a patent based upon a divisional of the Haseyama reference applied above.

US 6,190,181 B1 (**Affolter** et al.) and US 6,390,826 B1 (**Affolter** et al.) each teach spring contacts in a substrate for contacting a ball grid array.

US 6,409,521 B1 (**Rathburn**) teaches spring contacts in a substrate for contacting a ball grid array.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Erik Kielin whose telephone number is 703-306-5980. The examiner can normally be reached on 9:00 - 19:30 on Monday through Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Carl Whitehead, Jr., can be reached at 703-308-4940. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9318 for regular communications and 703-872-9319 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

Erik Kielin
April 15, 2003